Claims

1. A method for determining an optimal dispatch scheme for an on-site power generation arrangement, comprising the steps of:

(a) determining a dispatch need for said arrangement;

(b) determining a value for at least one non-iterative fuzzy variable associated with operation of said arrangement;

(c) determining a non-iterative ranking based on at least one non-iterative fuzzy truth table;

(d) determining a value for at least one iterative fuzzy variable associated with operation of said arrangement;

(e) determining a dispatch rank based on at least one iterative fuzzy truth table and ascending sort;

(f) repeating steps (c) and (d) until said determined dispatch need is met;

(g) determining an optimal dispatch scheme; and

(h) delivering a dispatch control file based on said dispatch scheme to said arrangement.

2. The method of claim 1 wherein step (g) includes the step of using case-based reasoning.

3. The method of claim 1 wherein step (g) includes the steps of determining an all-grid and an all-boiler solution.

4. The method of claim 1 wherein said at least one non-iterative fuzzy variable is taken from the group consisting of: cheap electricity, expensive electricity, cheap heat, expensive heat, low hours, high hours.

5. The method of claim 1 wherein said at least one iterative fuzzy variable is taken from the group consisting of: good or bad non-iterative dispatch membership, good or bad electric match membership, good or bad load match membership, good or bad load following match membership.

6. The method of claim 1 wherein said arrangement includes a plurality of energy generation units, and wherein said non-iterative ranking and said dispatch rank are determined based on at least a subset of said generation units.

7. The method of claim 1wherein said arrangement includes a plurality of energy generation units, and wherein step (e) further includes the step of dispatching the highest ranked unit.

8. The method of claim 7 wherein said dispatched unit is dispatched at optimal capacity.

9. The method of claim 1 wherein said steps (c) and (d) are further repeated at step (f) if at least reserve margin excess is less than zero.

10. The method of claim 1 including the step of, between steps (g) and (h), determining whether said arrangement is grid-connected or grid-isolated.

11. The method of claim 10 wherein, upon said arrangement being grid-isolated, adjusting said arrangement from an optimal operating point associated with said optimal dispatch scheme.

12. The method of claim 1 wherein said determined optimal dispatch scheme is one of the operational modes consisting of: economic dispatch, base load, peak shaving, economic dispatch plus peak shaving, single point control.

13. The method of claim 1 wherein said variable in steps (b) and (d) is a variable taken from the group consisting of: part load efficiency characteristics, capacity, output level, grid-connection status, temperature de-rating of equipment, load following requirements, reserve margin, n-1 requirements, start-up costs, hour of operation, running status, forecasted thermal load, forecasted electrical load, maintenance costs, fuel costs, grid price, thermal capacity costs.

14. A method for determining optimal dispatch schemes for an onsite power generation arrangement having at least one available energy generation unit, comprising the steps of:

determining an onsite generation requirement;

configuring said arrangement for operation;

determining whether said arrangement is grid-connected or grid-isolated; and

periodically determining an optimal economic operating point for said arrangement.

15. The method of claim 14 wherein, upon determining said arrangement to be grid-connected, determining whether generation for said arrangement has been contracted for export.

16. The method of claim 15 wherein, upon determining said arrangement to be contracted for export, determining a reserve margin.

17. The method of claim 14 including the step of equalizing the operations hours of the at least one available unit.

18. The method of claim 14 including the step of receiving part load efficiency information from said arrangement.

19. The method of claim 14 including the step of adjusting said optimal economic operating point based on a de-rating of said at least one available unit.

20. The method of claim 16 wherein said reserve margin is determined based on a forecasted load and including the step of establishing an available capacity based on said reserve margin.

21. The method of claim 14 wherein said optimal economic operating point is determined based on a periodic time resolution.

22. The method of claim 14 wherein said optimal economic operating point is determined based on at least one of: fuel cost, load management options, part load efficiency curves, unit availability.

23. The method of claim 14 wherein said step of configuring said arrangement includes the steps of:

configuring at least one site parameter taken from the group consisting of: default operational mode, load following requirement, electric rates, fuel costs, reserve margin, thermal or electric dispatch, n-1 requirement; and

configuring at least one unit parameter taken from the group consisting of: optimal electric capacity value, maintenance cost, maintenance interval, overhaul cost, overhaul interval, startup cost, shutdown cost.

24. A computer system for determining an optimal dispatch scheme for an on-site power generation arrangement, comprising:

means for determining a dispatch need for said arrangement;

means for determining a value for at least one non-iterative fuzzy variable associated with operation of said arrangement;

means for determining a non-iterative ranking based on at least one non-iterative fuzzy truth table;

means for determining a value for at least one iterative fuzzy variable associated with operation of said arrangement;

means for determining a dispatch rank based on at least one iterative fuzzy truth table and ascending sort;

means for determining whether said determined dispatch need is met;

means for determining an optimal dispatch scheme; and

means for delivering a dispatch control file based on said dispatch scheme to said arrangement.

25. A computer system for determining optimal dispatch schemes for an onsite power generation arrangement having at least one available energy generation unit, comprising:

means for determining an onsite generation requirement;

means for configuring said arrangement for operation;

means for determining whether said arrangement is grid-connected or grid-isolated; and

means for periodically determining an optimal economic operating point for said arrangement.